UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,265	08/27/2003	Robert R. Rice	20-016/000321-804	5230

23400 7590 06/09/2005

POSZ LAW GROUP, PLC
12040 SOUTH LAKES DRIVE
SUITE 101
RESTON, VA 20191

EXAMINER	
VANNUCCI, JAMES	

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 06/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/648,265	RICE, ROBERT R.	
	Examiner	Art Unit	
	Jim Vannucci	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,10-13,17 and 18* is/are rejected.

7)☒ Claim(s) *7-9 and 14-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8-27-03 & 11-23-04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karpinski(5,040,187) in view of Apollonov et al.(6,101,206).

Claim 1, figure 2 of Karpinski discloses a substrate(10) having first and second major surfaces and a plurality of grooves(20) formed in the first major surface of the substrate.

Karpinski does not disclose coolant channels.

Figure 3 of Apollonov discloses a plurality of grooves with a first groove that serves as a cooling channel(17) through which coolant flows to cool a substrate(8), and a laser diode bar(9) located in a second one of the plurality grooves with the first groove in close proximity to the second groove since each groove in Apollonov is both a coolant channel and a channel for a laser diode bar.

Claims 2-3, figure 7 of Apollonov discloses a metallization layer(11A) formed on side walls of all the grooves including the first and the second groove.

Claim 4, each and every groove disclosed in figure 3 of Apollonov is one of a plurality of grooves serving as cooling channels through which coolant flows to cool the

substrate, and is one of a plurality of grooves in which laser diode bars are respectively located.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the channels disclosed in Apollonov with the substrate disclosed in Karpinski to cool the substrate.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karpinski in view of Apollonov as applied above, and further in view of Benett et al.(5,548,605).

Karpinski and Apollonov do not disclose alternating cooling and laser diode channels.

Claim 5, figure 4 of Benett discloses grooves(62) that form cooling channels that are parallel to the grooves(64) in which laser diode bars are respectively located where the grooves that form cooling channels are alternated with the grooves in which laser diode bars are respectively located for optimum cooling(col. 5, lines 31-34).

It would have been obvious to one of ordinary skill in the art at the time of the invention to alternate the cooling and laser diode grooves disclosed in Karpinshi and Apollonov for improved cooling as disclosed in Benett.

4. Claims 10-12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benett in view of Apollonov.

Claim 10, Benett discloses a monolithic substrate(title; fig. 4, no. 60) with upper and lower major surfaces and grooves formed in the upper major surface along a length of the substrate where the grooves have side walls formed vertically in the substrate.

Benett does not disclose the recited laser diode and coolant groove arrangement.

Apollonov discloses a metallization layer formed along the side walls of the first and second grooves to form metallized grooves, laser diodes located in a first metallized groove, and where the second groove forms a cooling passage for cooling the laser diode array since each groove disclosed in Apollonov is both a coolant channel and has a laser diode for improved removal of heat(col. 2, lines 10-17).

Claim 11, each and every groove disclosed in figure 3 of Apollonov is one of a plurality of grooves serving as cooling channels through which coolant flows to cool the substrate, and is one of a plurality of grooves in which laser diode bars are respectively located.

Claim 12, figure 4 of Benett discloses grooves(62) that form cooling channels that are parallel to the grooves(64) in which laser diode bars are respectively located where the grooves that form cooling channels are alternated with the grooves in which laser diode bars are respectively located.

Claim 17, figure 3C of Benett discloses providing a monolithic substrate(title), forming a first groove(34) and a second groove(30) in the monolithic substrate such that the first groove is adjacent to and parallel to the second groove, forming side walls of the first and second grooves vertically in the monolithic substrate, setting a plurality of

laser diodes in at least the first groove such that a radiation emitting surface of each of the plurality of laser diodes is parallel to the major surface of the substrate, and leaving the second groove vacant to serve as a cooling channel to facilitate heat transfer from the laser diodes. Apollonov discloses depositing a metallization layer along at least the side walls of the first groove to form a metallized groove(col. 2).

Claim 18, figure 3C of Benett discloses forming a plurality of grooves that include the first groove(34) and the second groove(30) such that the first groove is one of a plurality of grooves that hold laser diodes and the second groove is one of a plurality of vacant grooves that are alternated with the grooves that hold laser diodes.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the groove arrangement disclosed in Apollonov with the device disclosed in Benett for improved heat removal as disclosed in Apollonov.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karpinski in view of Apollonov as applied above, and further in view of Lang et al.(6,240,116).

Karpinski and Apollonov do not disclose a housing with a window.

Claim 6, figure 4 of Lang discloses a laser diode apparatus is surrounded by a housing that includes a window(52) that is opposed to an emitting face of the laser diode bar(22) to receive the output from the laser diodes(col. 5, lines 64-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the housing disclosed in Lang with the device disclosed in Karpinski and Apollonov to facilitate output from the diode lasers as disclosed in Lang.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Apollonov in view of Benett as applied above, and further in view of Lang.

Apollonov and Benett do not disclose a housing with a window.

Claim 13, figure 4 of Lang discloses a laser diode array is surrounded by a housing that includes a window(52) that is opposed to emitting surfaces of the laser diodes(22) to receive light from the laser diodes(col. 5, lines 64-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the housing disclosed in Lang with the device disclosed in Apollonov and Benett to facilitate output from the diode lasers as disclosed in Lang.

Allowable Subject Matter

7. Claims 7-9 and 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter. The following limitations are primarily responsible for distinguishing these claims over the prior art.

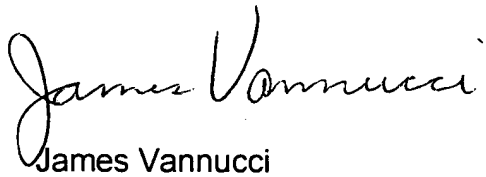
Regarding claims 7-9 and 14-16, the limitations concerning a space existing between the laser diode apparatus and the housing where coolant flows through the space and the space communicates with the cooling channel.

Correspondence

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Jim Vannucci whose phone number is (571) 272-1820.

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center whose telephone number is (703) 308-0956.

Papers related to Technology Center 2800 applications only may be submitted to Technology Center 2800 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Technology Center Fax Center number is (703) 872-9306.



James Vannucci